

SEQUENCE LISTING

<110> Chen, Yih-Tai
Cao, Longguang

<120> A synthetic DNA encoding an orange seapen-derived green fluorescent protein
with codon preference of mammalian expression systems and biosensors

<130> 41856-5

<160> 27

<170> PatentIn version 3.1

<210> 1

<211> 1482

<212> DNA

<213> Ptilosarcus gurneyi

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	ggcaagggca acgtgctgtt cggcaaccag ctgatgcaga tccgggtgac caagggcggc	180
	cctctgccct tcgccttcga catcgtgagc atcgccttcc agtacggcaa ccggaccttc	240
	accaagtatc ccgacgacat ccccgactac ttcgtgcaga gcttccctgc cggcttcttc	300
	tacgagcgga acctgcggtt cgaggacggc gccatcgtgg acatccggag cgacatcagc	360
	ctggaggacg acaagtcca ctacaagggtg gagtaccgcg gcaacggctt ccctagcaac	420
	ggccctgtga tgcagaaggc catcctgggc atggagccca gcttcgaggt ggtgtacatg	480

Sequence

aacagcggcg	tgctggtggg	cgaggtggac	ctggtgtaca	agctggagag	cggcaactac	540
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tacctattca	tccaccaccg	gctggagaa	aactacgtgg	aggagggcag	cttcgtggag	660
cagcacgaga	ccgccatcgc	ccagctgacc	accatcggca	agcctctggg	cagcctgcac	720
gagtgggtgt	aaagcggccg	caagcttgcc	accatggtga	accggaacgt	gctgaagaac	780
accggcctga	aggagatcat	gagcgccaag	gccagcgtgg	agggcatcgt	gaacaaccac	840
gtgttcagca	tggagggctt	cggcaagggc	aacgtgctgt	tggcaacca	gctgatgcag	900
atccgggtga	ccaagggcgg	ccctctgccc	ttcgccttcg	acatcgtgag	catcgccttc	960
cagtacggca	accggacctt	caccaagtat	cccgaagaca	tcgccgacta	cttcgtgcag	1020
agcttcccctg	ccggcttctt	ctacgagcgg	aacctgcggt	tcgaggacgg	cgccatcgtg	1080
gacatccgga	gcgacatcag	cctggaggac	gacaagttcc	actacaaggt	ggagtaccgc	1140
ggcaacggct	tccctagcaa	cggccctgtg	atgcagaagg	ccatccctggg	catggagccc	1200
agcttcgagg	tggtgtacat	gaacagcggc	gtgctggtgg	gcgagggtga	cctgggtgtac	1260
aagctggaga	gcggcaacta	ctacagctgc	cacatgaaga	ccttctaccg	gagcaagggc	1320
ggcgtgaagg	agtcccctga	gtacctattc	atccaccacc	ggctggagaa	gaactacgtg	1380
gaggagggca	gcttcgtgga	gcagcacgag	accgccatcg	cccagctgac	caccatcggc	1440
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<210> 2
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<213> Ptilosarcus gurneyi

<400> 2

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20     25     30
Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35     40     45
Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50     55     60
Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65     70     75     80
Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85     90     95
Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100    105    110

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PROTEIN

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr	115	120	125
Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile	130	135	140
Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val	145	150	155
Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr	165	170	175
Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys	180	185	190
Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr	195	200	205
Val Glu Glu Gly Ser Phe Val Glu Glu Gln His Glu Thr Ala Ile Ala Gln	210	215	220
Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val	225	230	235
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<213> Ptilosarcus gurneyi

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Sequence

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

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<213> Ptilosarcus gurneyi

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Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu Gly Ile Val
1 5 10 15

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Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly Asn Val Leu
20 25 30

Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly Gly Pro Leu
35 40 45

Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg
50 55 60

Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser
65 70 75 80

Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly
85 90 95

Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe
100 105 110

His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro
115 120 125

Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe Glu Val Val
130 135 140

Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu Val Tyr Lys

145 150 155 160

Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr Phe Tyr Arg
165 170 175

Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His Phe Ile His His
180 185 190

Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val Glu Gln His
195 200 205

Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly
210 215

<210> 5
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<212> PRT
<213> Ptilosarcus gurneyi

<400> 5

Met Val Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser
1 5 10 15

Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met
20 25 30

Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln

35

40 41 42 43 44 45

Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val
50 55 60

Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp
65 70 75 80

Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Tyr
85 90 95

Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser
100 105 110

Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg
115 120 125

Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu
130 135 140

Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu
145 150 155 160

Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr
165 170 175

Ptilosarcus gurneyi.ST25.txt

Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys Glu
180 185 190

Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val
195 200 205

Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu
210 215 220

Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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<211> 237
<212> PRT
<213> Ptilosarcus gurneyi

<400> 6

Met Val Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala
1 5 10 15

Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu
20 25 30

Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile
35 40 45

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Arg Val Thr Lys Gly Gly Pro Lys Pro Phe Ala Phe Asp Ile Val Ser
50      55      60
Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp
65      70      75      80
Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu
85      90      95
Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp
100     105     110
Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly
115     120     125
Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly
130     135     140
Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val
145     150     155     160
Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser
165     170     175
Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe
180     185     190

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Sequence

Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu
195 200 205

Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr
210 215 220

Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

<210> 7
<211> 236
<212> PRT
<213> Ptilosarcus gurneyi

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Met Val Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys
1 5 10 15

Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly
20 25 30

Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg
35 40 45

Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile
50 55 60

Sequence

Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile	70	75	80
65			
Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg	85	90	95
Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile	100	105	110
Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn	115	120	125
Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met	130	135	140
Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly	145	150	155
			160
Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys	165	170	175
His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro	180	185	190
Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu	195	200	205

Sequence

Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr
210 215 220

Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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<213> Ptilosarcus gurneyi

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Met Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala
1 5 10 15

Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe
20 25 30

Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val
35 40 45

Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala
50 55 60

Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala
65 70 75 80

FASTA

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Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn
      85                               90                      95

Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser
      100                             105                      110

Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly
      115                             120                      125

Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu
      130                             135                      140

Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu
      145                             150                      155                      160

Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His
      165                             170                      175

Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu
      180                             185                      190

Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly
      195                             200                      205

Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile

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210 215 220 225 230 235

Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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<212> PRT
<213> Ptilosarcus gurneyi

<400> 9

Met Val Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser
1 5 10 15

Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly
20 25 30

Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr
35 40 45

Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe
50 55 60

Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp
65 70 75 80

Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu

85	90	95
Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu		
100	105	110
Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe		
115	120	125
Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro		
130	135	140
Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val		
145	150	155
Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met		
165	170	175
Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr		
180	185	190
His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser		
195	200	205
Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly		
210	215	220

TEEE

Lys Pro Leu Gly Ser Leu His Glu Tyr Val 230
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 <213> Ptilosarcus gurneyi

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Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys 30
 20

Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys 45
 35

Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln 60
 50

Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr 80
 65

Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg 95
 85

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Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu
100
105
110
Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro
115
120
125
Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser
130
135
140
Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp
145
150
155
160
Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys
165
170
175
Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His
180
185
190
Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe
195
200
205
Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly Lys
210
215
220
Pro Leu Gly Ser Leu His Glu Trp Val
225
230

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PROTEIN

Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser
115 120 125

Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe
130 135 140

Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu
145 150 155 160

Val Tyr Lys Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr
165 170 175

Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His Phe
180 185 190

Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val
195 200 205

Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly Lys Pro
210 215 220

Leu Gly Ser Leu His Glu Trp Val
225 230

<210> 12
<211> 231

TELEGRAM

<212> PRT

<213> Ptilosarcus gurneyi

<400> 12

Met Val Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu Gly
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Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly Asn
20 25 30

Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly Gly
35 40 45

Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr Gly
50 55 60

Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Val
65 70 75 80

Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe Glu
85 90 95

Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp Asp
100 105 110

Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser Asn
115 120 125

Sequence

Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe Glu
130 135 140

Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu Val
145 150 155 160

Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr Phe
165 170 175

Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His Phe Ile
180 185 190

His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val Glu
195 200 205

Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly Lys Pro Leu
210 215 220

Gly Ser Leu His Glu Trp Val
225 230

<210> 13
<211> 224
<212> PRT
<213> Ptilosarcus gurneyi

<400> 13

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile

130

135 140 145

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

<210> 14

<211> 225

<212> PRT

<213> Ptilosarcus gurneyi

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Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser

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20      25      30
Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35      40      45
Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50      55      60
Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65      70      75      80
Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85      90      95
Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100      105      110
Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115      120      125
Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130      135      140
Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145      150      155      160

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Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
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Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Leu
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

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Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
 35                                     40 45
Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
 50                                     55 60
Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
 65                                     70 75 80
Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
 85                                     90 95
Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100                                     105 110
Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115                                     120 125
Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130                                     135 140
Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145                                     150 155 160
Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165                                     170 175

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ptilosarcus gurneyi.ST25.txt

10012642680

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Leu Thr
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Sequence

Gln	Ile	Arg	Val	Thr	Lys	Gly	Gly	Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	50	55	60
Val	Ser	Ile	Ala	Phe	Gln	Tyr	Gly	Asn	Arg	Thr	Phe	Thr	Lys	Tyr	Pro	65	70	75
Asp	Asp	Ile	Ala	Asp	Tyr	Phe	Val	Gln	Ser	Phe	Pro	Ala	Gly	Phe	Phe	85	90	95
Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg	100	105	110
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr	115	120	125
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile	130	135	140
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val	145	150	155
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr	165	170	175
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys	180	185	190

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Leu Thr Thr
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

FASTA

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr

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200 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Leu Thr Thr Ile
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<213> Ptilosarcus gurneyi

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro

65 70 80

GGGAGG

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Leu Thr Thr Ile Gly
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
 20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
 35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
 50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
 65 70 75 80

TELEFONO

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Leu Thr Thr Ile Gly Lys
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<213> Ptilosarcus gurneyi

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
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Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

FASTA

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Leu Thr Thr Ile Gly Lys Pro
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<213> Ptilosarcus gurneyi

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
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Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
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Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
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Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
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Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr

115

120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
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Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
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Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
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Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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990
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Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1      5      10      15
Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20      25      30
Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35      40      45
Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50      55      60
Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65      70      75      80
Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85      90      95
Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100     105     110
Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115     120     125
Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130     135     140

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Sequence

Leu Gly Met Glu Pro Ser Phe Glu Val Tyr Met Asn Ser Gly Val
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Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Sequence

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Met	Glu	Gly	Phe	Gly	Lys	Gly	Asn	Val	Leu	Phe	Gly	Asn	Gln	Leu	Met	35	40	45
Gln	Ile	Arg	Val	Thr	Lys	Gly	Gly	Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile	50	55	60
Val	Ser	Ile	Ala	Phe	Gln	Tyr	Gly	Asn	Arg	Thr	Phe	Thr	Lys	Tyr	Pro	65	70	75
Asp	Asp	Ile	Ala	Asp	Tyr	Phe	Val	Gln	Ser	Phe	Pro	Ala	Gly	Phe	Phe	85	90	95
Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg	100	105	110
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr	115	120	125
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile	130	135	140
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val	145	150	155
																160		

FASTA

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His
225 230 235

<210> 26
<211> 237
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<213> Ptilosarcus gurneyi

<400> 26

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

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Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr

165 170 175
 TGGTGGG

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
 180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
 195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
 210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu
 225 230 235

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
 20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met

35

40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Ptilosarcus gurneyi.ST25.txt

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp
225 230 235